



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

the center of a circle of position. And now from this point as center with radius AE (or BE) sweep the circle of position. And in like manner lay down the other circle of position through C and D.

This problem will often be found servicable to the Hydrographer and Explorer when from either accident or necessity only two angles are measured on four objects.

SOLUTIONS OF PROBLEMS IN NO. 6.

Solutions of problems in No. 6 have been received as follows: From Geo. L. Dake, 25 & 26; R. M. DeFrance, 25 & 26; Prof. A. B. Evans, 25, 26, 27 & 29; Henry Gunder, 25, 26, 27 & 29; Wm. Hoover, 26; Prof. A. Hall, 29; H. Heaton, 29; D. J. McAdam, 25 & 26; Esther Matthews, 26; Artemas Martin, 27 & 29; A. W. Phillips, 25, 26, 27 & 29; L. Regan, 25, 26 & 29; R. L. Selden, 25; Werner Stille, 25, 26, 27 & 29; E. B. Seitz, 25, 26, 27 & 29; Prof. J. Scheffer, 26 & 29; Walter Siverly, 27.

25. "Required the sides of an obtuse angled triangle the area of which is 14.048 acres, the obtuse angle $111^{\circ}15'$, and one of the acute angles $11^{\circ}44'10''$."

SOLUTION BY HENRY GUNDER, GREENVILLE, OHIO.

Putting $A = 111^{\circ}15'$, $B = 11^{\circ}44'10''$, $C = 57^{\circ}50''$, and x, y, z or the sides opposite A, B and C , and $a = 14.048$ acres $= 2247.68$ sq. rods.

Since the product of two sides and the sine of the included angle equals twice the area we have,

$$(1) xy = \frac{2a}{\sin C}, \quad (2) xz = \frac{2a}{\sin B}, \quad (3) yz = \frac{2a}{\sin A}. \quad \text{Then}$$

$$\sqrt{\frac{(1) \times (2)}{(3)}} = (4) x = \sqrt{\frac{2a \sin A}{\sin B \sin C}}. \quad \text{Similarly } y = \sqrt{\frac{2a \sin B}{\sin A \sin C}}.$$

$$\text{" } z = \sqrt{\frac{2a \sin C}{\sin A \sin B}}.$$

By applying logarithms, $x = 156.705$ rods, $y = 34.1997$ rods, $z = 141.034$ rods.

26. "Find θ from the equation $15 \sin \theta + 12 \cos \theta = 17.97240$, (1)."

SOLUTION BY WILLIAM HOOVER, SOUTH BEND, IND.

The given equation may be written, $m \sin \theta + n \cos \theta = q$ (2).
In (2) put $p \cos \phi = m$ and $p \sin \phi = n$ and it becomes

$$\sin (\theta + \phi) = \frac{q}{p} \dots \dots \dots (3).$$

$$\text{But } \frac{p \sin \phi}{p \cos \phi} = \tan \phi = \frac{n}{m}. \quad \therefore \phi = 38^{\circ}39'35''.$$

$$\theta + \phi = \sin^{-1} \frac{q}{n} \sin \phi = 69^{\circ}19'35''. \quad \therefore \theta = 30^{\circ}40',$$

27. "Four given equal spheres being placed in close contact with each other, it is required to find the volume of the space inclosed between them and the four triangular planes drawn respectively through each three centers."

SOLUTION BY E. B. SEITZ, GREENVILLE, O.

Let r = the radius of each sphere. Then $\frac{2}{3}r^3\sqrt{2}$ = the volume of the tetraedron formed by the four planes, and $\frac{4}{3}(3\cos^{-1}\frac{1}{3} - \pi)r^3$ = the volume of the four equal spherical sectors cut from the spheres by the planes.

Hence, the required volume is

$$V = \frac{2}{3}r^3\sqrt{2} - \frac{4}{3}(3\cos^{-1}\frac{1}{3} - \pi)r^3 = \frac{2}{3}r^3(\sqrt{2} + 2\pi - 6\cos^{-1}\frac{1}{3}) = .20775r^3.$$

[For want of room we are obliged to defer publishing the solution of 29 till next month.]

PROBLEMS.

34. BY PROF. M. L. COMSTOCK, GALESBURG, ILL.—Given $xyz = 18$, (1); $x^2 + y^2 + z^2 = 33$, (2); $(x^2 - yz)^3 + (y^2 - xz)^3 + (z^2 - xy)^3 - 3(x^2 - yz)(y^2 - xz)(z^2 - xy) = 6561$, (3); to find x , y and z .

35. BY CAPT. O. E. MEIBAEIS, PITTSBURGH, PA.—A man let a stone weighing 40 lbs. to a neighbor—the latter broke it accidentally into four parts—and upon returning the fragments consoled the owner by remarking that now he could weigh all numbers between one and forty. In other words, given $a + b + c + d = 40$, to determine such values for a , b , c and d , as will, by *association*, produce all numbers from one to forty.

36. BY HENRY A. ROLAND, TROY, N. Y.—A perfectly flexible cord of given length is suspended from two points whose coordinates are x', y' and x'', y'' . How must the weight of the cord vary from point to point in order that it may hang in the arc of a circle.